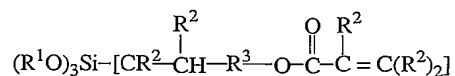


Remarks

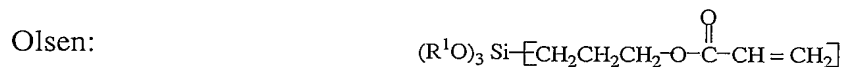
The rejection of the claims as obvious over Olsen et al. U.S. Patent No. 4,491,508 ("*Olsen*") has been maintained, and is respectfully traversed.

The Office contends that the compounds used by *Olsen* are structurally similar to those used as claimed by Applicants. However, this is incorrect.

Olsen's alkoxysilanes, have the formula (simplified) from column 1 and claim 1:



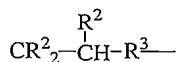
The Office states that this compound, when $R^2 = H$, and $R^3 = C_{1-8}$ hydrocarbon radical, is similar to Applicants' compounds when Applicants $R^3 = a C_{1-12}$ hydrocarbon radical. This is incorrect, however. When these substitutions are made, and R^3 in *Olsen* is a methylene group, and R^3 of Applicants is a methyl group, the structures are as follows:



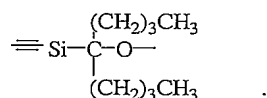
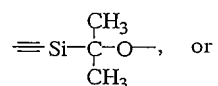
when in Applicants' formula $R^3 = H$, Applicants' compound is:



As can be clearly seen, the



group of *Olsen* requires minimally a chain of three carbon atoms, since R³ is a C₁₋₈ alkylene group (–CH₂–, –CH₂CH₂–, –CH₂CH₂CH₂–, etc.). (*Olsen* column 1, line 66: "R³ is a divalent C₁₋₈ alkylene radical"). Thus, in *Olsen*'s compounds, the silicon of the alkoxysilyl group is separated from the O of the methacrylate group by minimally three carbon atoms, *e.g.* 2-methacrylatopropyltrimethoxysilane, used in all of *Olsen*'s examples. In Applicants' composition, the silicon of the alkoxysilyl group is separated from the methacryloxy group by but a single carbon atom, regardless of whether this carbon atom is substituted by hydrogen or an alkyl group, *i.e.*



As indicated in MPEP § 2144.09, a rejection for obviousness is only appropriate in cases of close structural similarity when the respective compounds are position isomers (*i.e.* 1,3-dichlorophenyl versus 1,2-dichlorophenyl) or adjacent homologs, *i.e.* differing by but a single –CH₂– group. Moreover, *prima facie* obviousness based on structural similarity is rebutted when unexpected results are obtained.

Here, the minimum size of *Olsen*'s "linking" group between Si and O is propyl, –CH₂CH₂CH₂–, and the maximum is decyl –(CH₂)₁₀–. In Applicants' process, the maximum length linking group is methylene, –CH₂–. Methylene and propylene are not adjacent homologs, and the principles of homology and structural similarity do not apply. Moreover, in Applicant's compounds, anchimeric assistance may be occurring, while anichimeric assistance cannot operate with ethylene, propylene, or higher alkylene linking groups. *See, e.g.,* March, ADVANCED ORGANIC CHEMISTRY: REACTIONS, MECHANISMS AND STRUCTURE, McGraw-Hill, New York, c. 1968, p. 362.

Moreover, compounds containing an alkoxysilyl group separated from an electronegative group by but a methylene group are known to behave very differently from otherwise similar compounds containing a propylene group. For example, aminopropyltrimethoxysilane is a compound which can be dispersed in water and hydrolyzes by reaction of the silicon-bonded methoxy groups to produce polymeric and oligomeric siloxanes, whereas aminomethyltrimethoxysilane, as reported in the scientific literature, decomposes in water, liberating methyl amine and producing silica, SiO_2 . These compounds are far different, the difference being the nature of the linking group: methylene or propylene.

Dr. Christoph Briehn, one of the inventors of the claimed invention, prepared additional examples and comparative examples. In these examples, the proportion of silica used is kept at 35 weight percent. In the first example (inventive), the claimed methacrylatomethyltrimethoxysilane is used to functionalize the silica, whereas in Comparative Examples A and B, an *Olsen* silane, methacrylatopropyltrimethoxysilane was used. In Comparative Example A, the solvent used was t-butanol, as used by *Olsen*. In Comparative Example B, ethanol, as used in the additional inventive example, was employed. The scratch resistance of the comparative example using the same solvent (ethanol) was 26% lower than the inventive example, while that of the comparative example using *Olsen*'s t-butanol solvent was lower by 21%. A 20 plus % increase in scratch resistance is highly significant, and both surprising and unexpected. *Olsen* does not teach or suggest using Applicants' claimed silanes to functionalize silica, and the results achieved are highly surprising and unexpected. Withdrawal of the rejection of the claims over *Olsen* for both these reasons is respectfully solicited.

Applicants submit that the claims are now in condition for Allowance, and respectfully request a Notice to that effect. If the Examiner believes that further discussion will advance the prosecution of the Application, the Examiner is highly encouraged to telephone Applicants' attorney at the number given below.

The Petition fee of \$130.00 is being charged to Deposit Account No. 02-3978 via electronic authorization submitted concurrently herewith. The Commissioner is hereby authorized to charge any additional fees or credit any overpayments as a result of the filing of this paper to Deposit Account No. 02-3978.

Respectfully submitted,

Christoph Briehn et al.

By 

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Date: June 4, 2009

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Enclosure: Declaration Under Rule 132